

CLAIMS

1) Water dispersible or water soluble porous bodies comprising a three dimensional open-cell lattice
5 containing

(a) 10 to 95% by weight of a water soluble polymeric material and

(b) 5 to 90% by weight of a surfactant,

said porous bodies having an intrusion volume as measured by mercury porosimetry of at least
about 3 ml/g

10 with the proviso that said porous bodies are not spherical beads having an average bead diameter
of 0.2 to 5mm

2) Porous bodies as claimed in claim 1 wherein the bodies are in the form of powders, beads or
moulded bodies

15

3) Porous bodies as claimed in claim 1 or claim 2 wherein the polymeric material is a natural gum,
a polysaccharide, a cellulose derivative or a homopolymer or copolymer comprising (co)monomers
selected from:-

vinyl alcohol,

20

acrylic acid,

methacrylic acid

acrylamide,

methacrylamide

acrylamide methylpropane sulphonates

25

aminoalkylacrylates

aminoalkylmethacrylates

hydroxyethylacrylate

hydroxyethylmethacrylate

vinyl pyrrolidone

30

vinyl imidazole

vinyl amines

vinyl pyridine

ethyleneglycol

ethylene oxide

35

ethyleneimine

styrenesulphonates
ethyleneglycolacrylates
ethyleneglycol methacrylate

- 5 4) Porous bodies as claimed in claim 3 wherein the cellulose derivative is selected from xanthan gum, xyloglucan, cellulose acetate, methylcellulose, methylethylcellulose, hydroxyethylcellulose, hydroxyethylmethylcellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose (HPMC), hydroxypropylbutylcellulose, ethylhydroxyethylcellulose, carboxymethylcellulose and its salts, or carboxymethyl-hydroxyethylcellulose and its salts
- 10 5) Porous bodies as claimed in any preceding claim wherein the surfactant is non-ionic, anionic, cationic, or zwitterionic
- 6) Porous bodies as claimed in any preceding claim wherein the surfactant is solid at ambient
- 15 temperature
- 7) Porous bodies as claimed in any preceding claim wherein the surfactant is selected from ethoxylated triglycerides; fatty alcohol ethoxylates; alkylphenol ethoxylates; fatty acid ethoxylates; fatty amide ethoxylates; fatty amine ethoxylates; sorbitan alkanoates; ethylated sorbitan alkanoates;
- 20 alkyl ethoxylates; pluronics; alkyl polyglucosides; stearyl ethoxylates; alkyl polyglycosides; alkylether sulfates; alkylether carboxylates; alkylbenzene sulfonates; alkylether phosphates; dialkyl sulfosuccinates; alkyl sulfonates; soaps; alkyl sulfates; alkyl carboxylates; alkyl phosphates; paraffin sulfonates; secondary n-alkane sulfonates; alpha-olefin sulfonates; isethionate sulfonates; fatty amine salts; fatty diamine salts; quaternary ammonium compounds; phosphonium surfactants;
- 25 sulfonium surfactants; sulfonxonium surfactants; N-alkyl derivatives of amino acids (such as glycine, betaine, aminopropionic acid); imidazoline surfactants; amine oxides; amidobetaines; and mixtures thereof
- 8) Porous bodies as claimed in any preceding claim wherein the porous polymeric bodies have
- 30 water soluble or water insoluble materials incorporated into the polymeric lattice
- 9) Water soluble porous polymeric bodies as claimed in claim 8 wherein the water soluble material is selected from water soluble vitamins; water soluble fluorsceners; activated aluminium chlorohydrate; transition metal complexes used as bleaching catalysts; water soluble polymers;

diethylenetriaminepentaacetic acid (DTPA); primary and secondary alcohol sulphates containing greater than C8 chain length or mixtures thereof

10) Water soluble porous polymeric bodies as claimed in claim 8 wherein the water insoluble material is selected from antimicrobial agents; antidandruff agent; skin lightening agents; fluorescing agents; antifoams; hair conditioning agents; fabric conditioning agents; skin conditioning agents; dyes; UV protecting agents; bleach or bleach precursors; antioxidants; insecticides; pesticides; herbicides; perfumes or precursors thereto; flavourings or precursors thereto; pharmaceutically active materials; hydrophobic polymeric materials and mixtures thereof.

11) A method for preparing water dispersible or water soluble porous bodies comprising a three dimensional open-cell lattice containing

(a) 10 to 95% by weight of a water soluble polymeric material and

(b) 5 to 90% by weight of a surfactant,

said porous bodies having an intrusion volume as measured by mercury porosimetry (as hereinafter described) of at least about 3 ml/g

with the proviso that said porous bodies are not spherical beads having an average bead diameter of 0.2 to 5mm

comprising the steps of:

a) providing an intimate mixture of the polymeric material and the surfactant in a liquid medium

b) providing a fluid freezing medium at a temperature effective for rapidly freezing the liquid medium;

c) cooling the liquid medium with the fluid freezing medium at a temperature below the freezing point of the liquid medium for a period effective to rapidly freeze the liquid medium; and

d) freeze-drying the frozen liquid medium to form the porous bodies by removal of the liquid medium by sublimation.

12) A method as claimed in claim 11 wherein the cooling of the liquid medium is accomplished by spraying an atomised emulsion into the fluid freezing medium; by dropping drops of the emulsion into the fluid freezing medium or by pouring the emulsion into a mould and cooling the emulsion in the mould.

13) A method as claimed in claim 11 or 12 wherein the polymeric material is a natural gum, a polysaccharide, a cellulose derivative or a homopolymer or copolymer comprising (co)monomers selected from:-

5 vinyl alcohol,
acrylic acid,
methacrylic acid
acrylamide,
methacrylamide
acrylamide methylpropane sulphonates
10 aminoalkylacrylates
aminoalkylmethacrylates
hydroxyethylacrylate
hydroxyethylmethacrylate
vinyl pyrrolidone
15 vinyl imidazole
vinyl amines
vinyl pyridine
ethyleneglycol
ethylene oxide
20 ethyleneimine
styrenesulphonates
ethyleneglycolacrylates
ethyleneglycol methacrylate

25 14) A method as claimed in any one of claims 11 to 13 wherein the surfactant is non-ionic, anionic, cationic, or zwitterionic

15) A method as claimed in any one of claims 11 to 14 wherein the surfactant is solid at ambient temperature

30 16) A method as claimed in any one of claims 11 to 15 wherein the surfactant has an HLB value of 8 to 18

17) A method as claimed in any one of claims 11 to 16 wherein the surfactant is selected from
35 ethoxylated triglycerides; fatty alcohol ethoxylates; alkylphenol ethoxylates; fatty acid ethoxylates;

fatty amide ethoxylates; fatty amine ethoxylates; sorbitan alkanoates; ethylated sorbitan alkanoates; alkyl ethoxylates; pluronics; alkyl polyglucosides; stearyl ethoxylates; alkyl polyglycosides; alkylether sulfates; alkylether carboxylates; alkylbenzene sulfonates; alkylether phosphates; dialkyl sulfosuccinates; alkyl sulfonates; soaps; alkyl sulfates; alkyl carboxylates; alkyl phosphates; paraffin sulfonates; secondary n-alkane sulfonates; alpha-olefin sulfonates; isethionate sulfonates; fatty amine salts; fatty diamine salts; quaternary ammonium compounds; phosphonium surfactants; sulfonium surfactants; sulfonxonium surfactants; N-alkyl derivatives of amino acids (such as glycine, betaine, aminopropionic acid); imidazoline surfactants; amine oxides; amidobetaines; and mixtures thereof

1 0

18) A method as claimed in claim 11 wherein the intimate mixture is an oil-in-water emulsion

19) A method as claimed in claim 18 wherein the discontinuous phase of the emulsion comprises 10 to 95% by volume of the emulsion

1 5

20) A method as claimed in claim 18 wherein the discontinuous phase of the emulsion comprises 20 to 60% by volume of the emulsion

21) A method as claimed in claim 18 wherein the discontinuous phase of the emulsion is selected from alkanes; cyclic hydrocarbons; halogenated alkanes; esters; ketones; ethers; volatile cyclic silicones and mixtures thereof

2 0

22) Solutions or dispersions comprising water soluble polymeric materials and surfactant formed by exposing the porous bodies of any one of claims 1 to 10 to an aqueous medium.

2 5

23) Solutions or dispersions comprising water soluble polymeric materials, surfactant and a hydrophobic material formed by exposing the porous bodies of claim 8 having the hydrophobic material contained therein to an aqueous medium.

3 0